

# Distributed Acoustic Arrays: Infrastructure Architecture and Performance

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DARPA Air-Coupled Acoustic Sensors Workshop  
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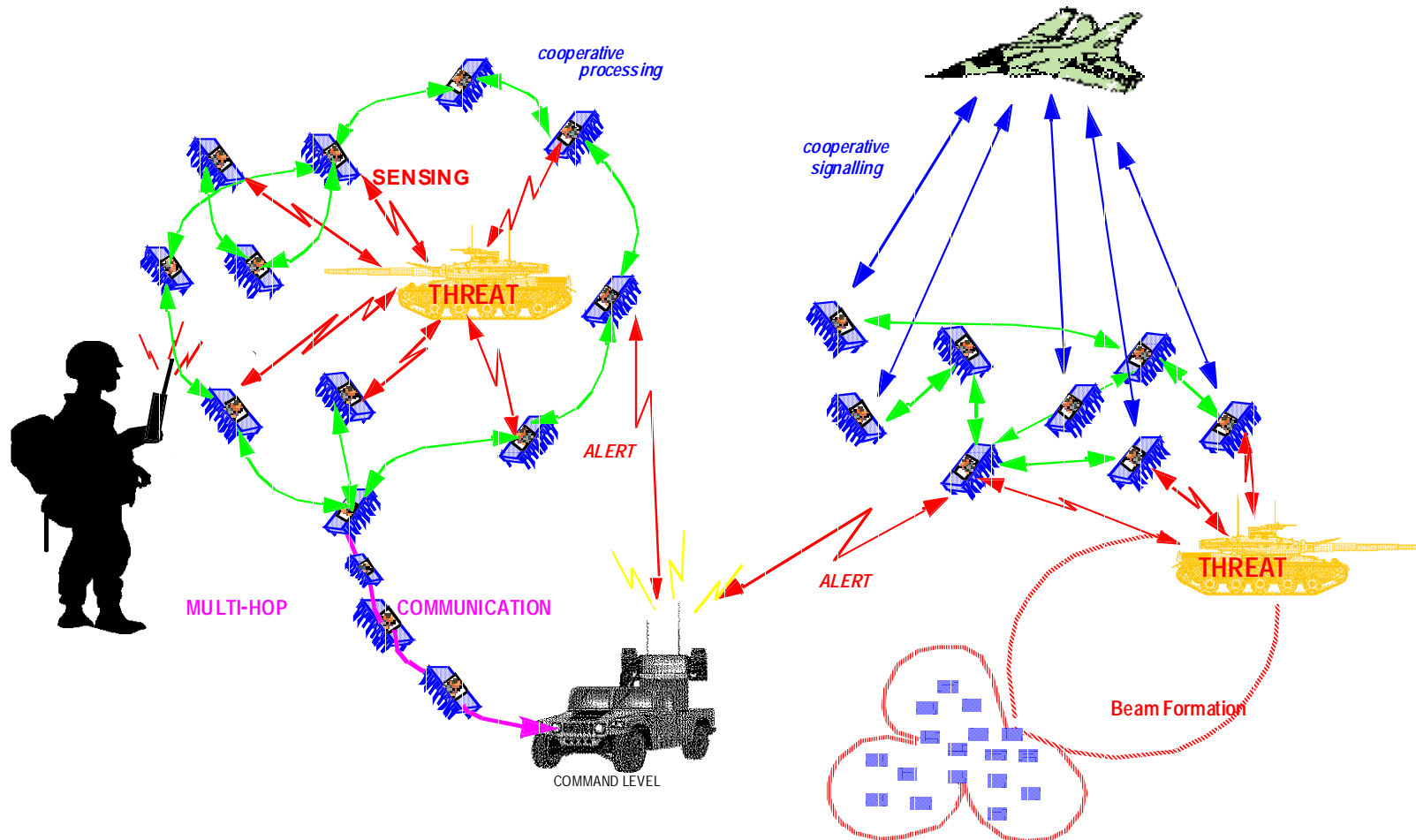
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# Distributed Acoustic Arrays: Infrastructure Architecture and Performance

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- Concept:
  - A large number of sensor “nodes” cooperate.
  - Each node has an acoustic and possibly other sensors.
  - Each node has signal processing capability.
  - Each node is small, lightweight and inexpensive.
  - The nodes interact by wireless communications.
  - The nodes are easily deployed and self-organizing.
  - The nodes cooperate to provide low-power operation (hence longevity) to detect, localize and identify targets.
- Under the DARPA/ATO AWAIRS program, UCLA and the Rockwell Science Center have progressed toward achieving this system concept.

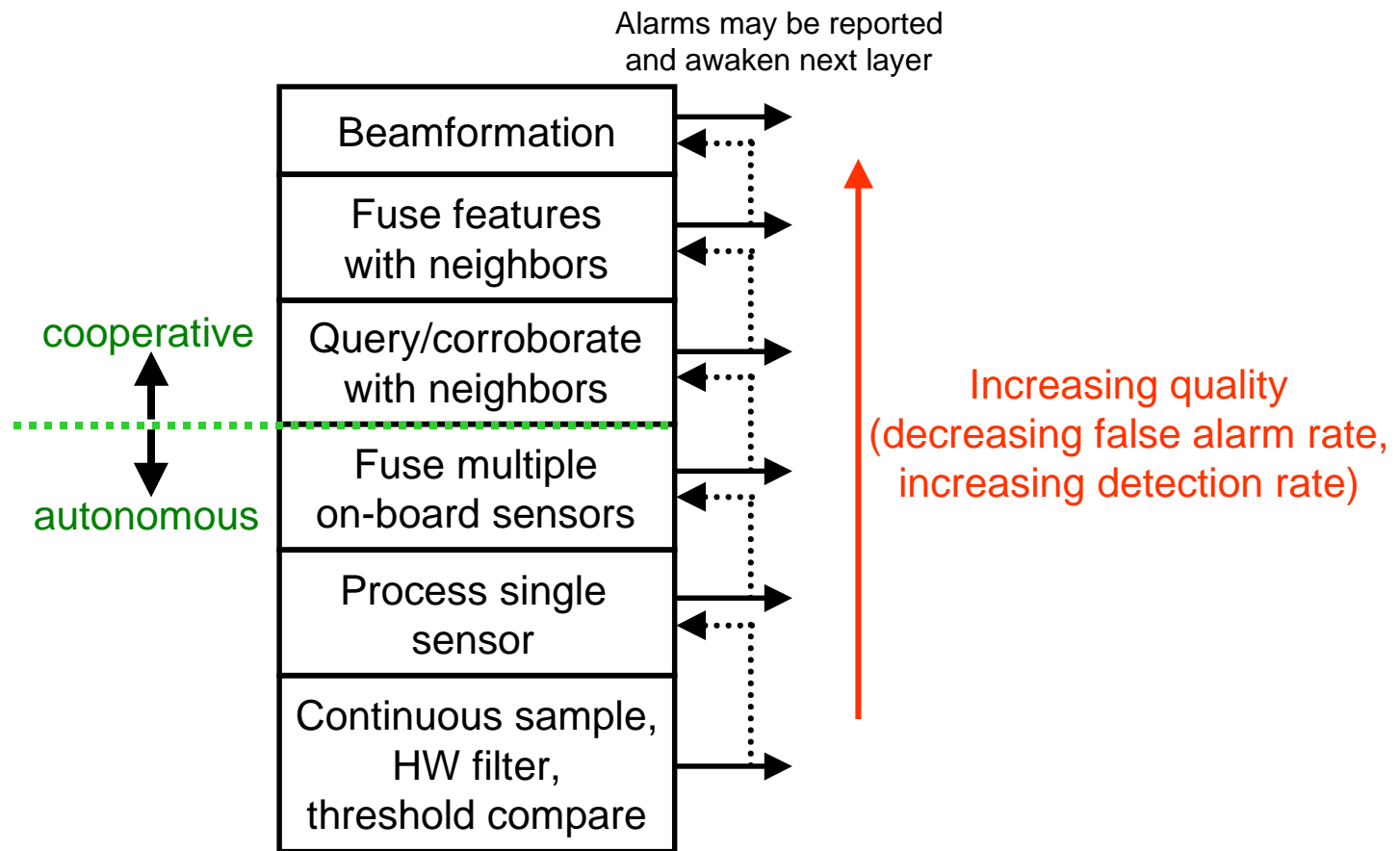
# AWAIRS: Adaptive Wireless Arrays for Interactive RSTA for SUO



# AWAIRS 1 PROTOTYPE NODE



# Distributed Wireless Microsensor Network: Signal Processing Architecture for Low-Power Operation



# Distributed Microsensor Arrays: Wireless Communications Networking

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We have developed a prototype system capable of

- Synchronous streaming data collection from dispersed sensor nodes
  - Star radio topology to base station(s)
  - Each node samples at 1kHz
  - Internode sync within 100  $\mu$ sec
- Realtime “detection network” where target decisions are derived on-board each node and exchanged with neighbors
  - Extending infrastructure to accommodate dynamic establishment of streaming circuits to support on-line beamformation